

| <b>ORDER FOR SUPPLIES OR SERVICES</b>   |  |  |   |   |  |                      |   |   |                                 | PAGE 1 OF 17             |  |
|---|--|--|---|---|--|----------------------|---|---|---------------------------------|--------------------------|--|
| 1. CONTRACT/PURCH. ORDER/ AGREEMENT NO.<br>W912DW-04-P-0278   |  |  | 2. DELIVERY ORDER/ CALL NO.<br>W912DW   |   | 3. DATE OF ORDER/CALL (YYYYMMDD)<br>2004 Jul 09  |                      | 4. REQ./ PURCH. REQUEST NO.<br>W68MD9-4159-5405                   |   | 5. PRIORITY                     |                          |  |
| 6. ISSUED BY<br>USA ENGINEER DISTRICT, SEATTLE<br>ATTN: CENWS-CT<br>4735 EAST MARGINAL WAY SOUTH<br>SEATTLE WA 98134-2329   |  |  | 7. ADMINISTERED BY (if other than 6)<br>USA ENGINEER DISTRICT, SEATTLE<br>SCOTT BRITT<br>PH:206-764-3517 FAX: 206-764-6817<br>SCOTT.W.BRITT@US.ARMY.MIL<br>SEATTLE WA |   | 8. DELIVERY FOB<br><input checked="" type="checkbox"/> DESTINATION<br><input type="checkbox"/> OTHER<br><br>(See Schedule if other)                          |                      |   |   |                                 |                          |  |
| 9. CONTRACTOR<br>GLS, INC.<br>DON J MORRISON<br>2220 RIVER DRIVE NORTH<br>GREAT FALLS MT 59401-1378   |  |  | 10. DELIVER TO FOB POINT BY (Date)<br>(YYYYMMDD)<br><b>SEE SCHEDULE</b>   |   | 11. MARK IF BUSINESS IS<br><input checked="" type="checkbox"/> SMALL<br><input type="checkbox"/> SMALL DISADVANTAGED<br><input type="checkbox"/> WOMEN-OWNED |                      |   |   |                                 |                          |  |
| 12. DISCOUNT TERMS  |  |  | 13. MAIL INVOICES TO THE ADDRESS IN BLOCK<br>See Item 15  |   |  |                      |   |   |                                 |                          |  |
| 14. SHIP TO<br>MAINTENANCE SECTION(LI)<br>17155 HIGHWAY #37<br>LIBBY MT 59923-9703  |  |  | 15. PAYMENT WILL BE MADE BY<br>US ARMY CORPS OF ENGRS FINANCE CENTER<br>CEFC-AO-P 901-874-8556<br>5722 INTEGRITY DRIVE<br>MILLINGTON TN 38054-5005                    |   | <b>MARK ALL PACKAGES AND PAPERS WITH IDENTIFICATION NUMBERS IN BLOCKS 1 AND 2.</b>   |                      |   |   |                                 |                          |  |
| 16. TYPE OF ORDER   |  | DELIVERY/ CALL                               |   | This delivery order/call is issued on another Government agency or in accordance with and subject to terms and conditions of above numbered contract. |  |                      |   |   |                                 |                          |  |
|   |  | PURCHASE                                     |   | Reference your quote dated 2004 Jun 24<br>Furnish the following on terms specified herein. REF:   |  |                      |   |   |                                 |                          |  |
| ACCEPTANCE. THE CONTRACTOR HEREBY ACCEPTS THE OFFER REPRESENTED BY THE NUMBERED PURCHASE ORDER AS IT MAY PREVIOUSLY HAVE BEEN OR IS NOW MODIFIED. SUBJECT TO ALL OF THE TERMS AND CONDITIONS SET FORTH, AND AGREES TO PERFORM THE SAME. |  |  |   |   |  |                      |   |   |                                 |                          |  |
| NAME OF CONTRACTOR  |  |  | SIGNATURE   |   |  | TYPED NAME AND TITLE |   |   | DATE SIGNED (YYYYMMDD)          |                          |  |
| <input type="checkbox"/> If this box is marked, supplier must sign Acceptance and return the following number of copies:  |  |  |   |   |  |                      |   |   |                                 |                          |  |
| 17. ACCOUNTING AND APPROPRIATION DATA/ LOCAL USE<br><br><b>See Schedule</b>   |  |  |   |   |  |                      |   |   |                                 |                          |  |
| 18. ITEM NO.  |  | 19. SCHEDULE OF SUPPLIES/ SERVICES           |   |   | 20. QUANTITY ORDERED/ ACCEPTED*  |                      | 21. UNIT  | 22. UNIT PRICE  |                                 | 23. AMOUNT               |  |
|   |  | <b>SEE SCHEDULE</b>                          |   |   |  |                      |   |   |                                 |                          |  |
| * If quantity accepted by the Government is same as quantity ordered, indicate by X. If different, enter actual quantity accepted below quantity ordered and encircle.  |  |  |   | 24. UNITED STATES OF AMERICA<br>TEL: (206) 764-3638<br>EMAIL: elaine.m.ebert@usace.army.mil<br>BY: ELAINE M EBERT                                     |  |                      |   | <i>Elaine M Ebert</i><br>CONTRACTING / ORDERING OFFICER |                                 | 25. TOTAL<br>\$64,790.00 |  |
| 26. DIFFERENCES   |  |  |   |   |  |                      |   |   |                                 |                          |  |
| 27a. QUANTITY IN COLUMN 20 HAS BEEN<br><input type="checkbox"/> INSPECTED <input type="checkbox"/> RECEIVED <input type="checkbox"/> ACCEPTED, AND CONFORMS TO THE CONTRACT EXCEPT AS NOTED   |  |  |   |   |  |                      |   |   |                                 |                          |  |
| b. SIGNATURE OF AUTHORIZED GOVERNMENT REPRESENTATIVE  |  |  |   |   | c. DATE (YYYYMMDD)   |                      | d. PRINTED NAME AND TITLE OF AUTHORIZED GOVERNMENT REPRESENTATIVE |   |                                 |                          |  |
| e. MAILING ADDRESS OF AUTHORIZED GOVERNMENT REPRESENTATIVE  |  |  |   |   | 28. SHIP NO.   |                      | 29. DO VOUCHER NO.  |   | 30. INITIALS                    |                          |  |
| f. TELEPHONE NUMBER   |  | g. E-MAIL ADDRESS                            |   |   | <input type="checkbox"/> PARTIAL<br><input type="checkbox"/> FINAL   |                      | 32. PAID BY   |   | 33. AMOUNT VERIFIED CORRECT FOR |                          |  |
| 36. I certify this account is correct and proper for payment.   |  |  |   |   | 31. PAYMENT<br><input type="checkbox"/> COMPLETE<br><input type="checkbox"/> PARTIAL<br><input type="checkbox"/> FINAL                                       |                      | 34. CHECK NUMBER  |   |                                 |                          |  |
| a. DATE (YYYYMMDD)  |  | b. SIGNATURE AND TITLE OF CERTIFYING OFFICER |   |   |  |                      | 35. BILL OF LADING NO.  |   |                                 |                          |  |
| 37. RECEIVED AT   |  | 38. RECEIVED BY                              |   | 39. DATE RECEIVED (YYYYMMDD)  |  | 40. TOTAL CONTAINERS |   | 41. S/R ACCOUNT NO.                                     |                                 | 42. S/R VOUCHER NO.      |  |

## Section B - Supplies or Services and Prices

| ITEM NO | SUPPLIES/SERVICES | QUANTITY | UNIT     | UNIT PRICE  | AMOUNT      |
|---------|-------------------|----------|----------|-------------|-------------|
| 0001    |                   | 2        | Lump Sum | \$16,197.50 | \$32,395.00 |

SQ1 - TWO NEW STA SVC TRANSFORMERS FOR  
FFP

SUBSTATION SQ1 - Provide (2) dry-type substation transformers, three phase, 60Hz. 1000kVA, 13800-480 Volts in accordance with the incorporated statement of work, specifications, and drawings. FOB Destination Delivery.

Unit Price \$16,197.50 X2 = TOTAL \$32,395.00

PURCHASE REQUEST NUMBER: W68MD9-4159-5405

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|         |             |
|---------|-------------|
| NET AMT | \$32,395.00 |
|---------|-------------|

|                       |             |
|-----------------------|-------------|
| ACRN AA Funded Amount | \$32,395.00 |
|-----------------------|-------------|

FOB: Destination

| ITEM NO | SUPPLIES/SERVICES | QUANTITY | UNIT     | UNIT PRICE  | AMOUNT      |
|---------|-------------------|----------|----------|-------------|-------------|
| 0002    |                   | 2        | Lump Sum | \$16,197.50 | \$32,395.00 |

SQ2 - TWO NEW STA SVC TRANSFORMERS FOR  
FFP

SUBSTA SQ2 - Provide (2) dry-type substation transformers, three phase, 60Hz. 1000kVA, 13800-480 Volts in accordance with the incorporated Statement of Work, specifications, and drawings. FOB Destination Delivery.

Unit Price \$16,197.50 X2 = TOTAL \$32,395.00

Deliver all items to the following address:

MAINTENANCE SECTION(LI)

17155 HIGHWAY #37

LIBBY MT 59923-9703

PURCHASE REQUEST NUMBER: W68MD9-4159-5405

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|         |             |
|---------|-------------|
| NET AMT | \$32,395.00 |
|---------|-------------|

|                       |             |
|-----------------------|-------------|
| ACRN AB Funded Amount | \$32,395.00 |
|-----------------------|-------------|

FOB: Destination

## Section C - Descriptions and Specifications

STATEMENT OF WORK

## LIBBY POWERHOUSE SUBSTATION TRANSFORMER

## 1.1 DESCRIPTION OF WORK

This contract covers the supply and delivery of four indoor dry-type, self-cooled (Class AA), 3-phase substation transformers, rated 13,800V delta – 480V delta, 60Hz, and 1000kVA at Libby Powerhouse.

## 1.2 ATTACHMENTS

## SPECIFICATIONS:

16270 SUBSTATION TRANSFORMER, DRY-TYPE

## DRAWINGS

Reference drawings required by the Contractor, but not included in these plans and specifications, to determine the size of the existing enclosures, location for the new transformers and other information as necessary, will be provided by the Government.

## POINTS OF CONTACT:

## CONTRACT ADMINISTRATION

US Army Corps of Engineers

Seattle District

ATTN: CENWS-CT-PR

P.O. Box 3755

Seattle, WA 98124-3755

Scott Britt (206) 764-3517

## TECHNICAL POINT OF CONTACT

US Army Corps of Engineers

Portland District

ATTN: CENWP-HDC-P

P.O. Box 2946

Portland, OR 97208-2946

Jeremy Harvison (503) 808-4283

## 1.3 CONTRACTOR'S SUBMITTALS

All approved submittals will form a part of the contract. All submittals shall be addressed to the following offices:

Two copies to:

U. S. Army Corps of Engineers

Hydroelectric Design Center

ATTN: CENWP-HDC-P

P. O. Box 2946

Portland, OR 97208-2946

One copy to:

U.S. Army Corps of Engineers

Libby Dam Project Office

ATTN: Jeffrey Regh

17115 Highway #37

Libby, MT. 59923-9703

1.3.1 Shop drawings shall be prepared using Microstation V8.0 Computer-Aided Design System software, and shall be submitted in Microstation V8.0 format.

1.3.2 All drawing and data submitted and approved will form a part of the contract. The sequence of submission of drawings shall be such that all information is available for checking each drawing when it is received. The drawing shall include parts lists and material schedules listing all items called out on the drawings.

1.3.3 Three copies of each drawing and data shall be submitted to the addresses shown above. Each submission of drawings and data must be accompanied by transmittal Form 4025 (copy attached at end of this section) containing a list of drawings giving titles and numbers. All correspondence, drawings, literature, instruction books, data, and nameplates shall be in the English language, with English units as currently used in the United States.

**The following action codes are for submittals requiring Government approval (GA).**

a. Action Code A (Approved as Submitted). Submittals which can be approved without correction will be stamped "Approved", one copy of catalog and other printed data, will be returned to the Contractor.

b. Action Code B (Approved, Except as Noted, Resubmission Not Required). Submittals which have only minor discrepancies will be corrected and stamped "Approved as Corrected" or "Except as Noted." Corrections will be identified. Distribution will be same as for "Approved" submittals.

c. Action Code C (Approved, Except as Noted, Resubmission Required). One copy of submittals which are incomplete or require more than minor corrections will be marked in red to indicate necessary corrections. The marked copy will be returned to the Contractor stamped "Returned for Correction."

d. Action Code E (Disapproved). One copy of submittals which are fundamentally in error, cover wrong equipment or construction, or require extensive corrections will be returned to the Contractor stamped "Disapproved." An explanation will be furnished on the copy indicating reason for disapproval.

e. Resubmittal. Resubmittal will not be required for submittals with Action Code A or B unless subsequent changes are made by the Contractor or by a contract modification. For submittals with Action Code C or E, corrections required shall be made, any changes shall be noted by dating the revisions to correspond with the change request date, and the submittals shall be promptly resubmitted for review. Government costs incurred after the first resubmittal will be charged to the Contractor.

Upon receipt of submittals which have Action Codes C, or E the Contractor shall within 30 calendar days after receipt, submit corrected copies of each submittal to the address stated above. If revisions are made after a submittal has been assigned an A or B code, the Contractor shall furnish corrected copies subsequent to each revision.

#### 1.4 SUBMITTAL DESCRIPTIONS

The submittals described below are those required and are further described in the technical sections of the specifications. Submittals required by the CONTRACT CLAUSES and other nontechnical parts of the contract are not included in this list.

##### SD-01 Data

Submittals which provide calculations, descriptions, or documentation regarding the work.

##### SD-04 Drawings

Submittals which graphically show relationship of various components of the work, schematic diagrams of systems, details of fabrication, layouts of particular elements, connections, and other relational aspects of the work. All drawings shall be submitted in both paper and electronic formats.

##### SD-06 Instructions

Preprinted material describing installation of a product, system or material, including special notices and material safety data sheets, if any, concerning impedance's, hazards, and safety precautions. Operation and maintenance manuals are considered deliverables under the contract and not submittals; however, when necessary to review information to be included in the final manuals such information to be included in the final manuals should be called for under this submittal description.

##### SD-07 Schedules

Tabular lists showing location, features, or other pertinent information regarding products, materials, equipment, or components to be used in the work.

##### SD-08 Statements

A document, required of the Contractor, or through the Contractor, from a supplier, installer, manufacturer, or other lower tier Contractor, the purpose of which is to confirm the quality or orderly progression of a portion of the work by documenting procedures, acceptability of methods or personnel, qualifications, or other verifications of quality.

##### SD-09 Reports

Reports of inspections or tests, including analysis and interpretation of test results. Each report shall be properly identified. Test methods used shall be identified and test results shall be recorded.

##### SD-13 Certificates

Statement signed by an official authorized to certify on behalf of the manufacturer of a product, system or material, attesting that the product, system or material meets specified requirements. The statement must be dated after the

award of this contract, must state the Contractor's name and address, must name the project and location, and must list the specific requirements which are being certified.

SD-14 Samples

Samples, including both fabricated and unfabricated physical examples of materials, products, and units of work as complete units or as portions of units of work.

SD-18 Records

Documentation to record compliance with technical or administrative requirements.

| TRANSMITTAL OF SHOP DRAWINGS, EQUIPMENT DATA, MATERIAL SAMPLES, OR<br>MANUFACTURER'S CERTIFICATES OF COMPLIANCE<br><small>(Read instructions on the reverse side prior to initiating this form)</small> |   |  |                     | DATE  |   | TRANSMITTAL NO.               |  |                          |
|---|---|--|---------------------|---|---|-------------------------------|--|--------------------------|
| SECTION I - REQUEST FOR APPROVAL OF THE FOLLOWING ITEMS <small>(This section will be initiated by the contractor)</small>   |   |  |                     |   |   |                               |  |                          |
| TO:   |   | FROM:  |                     | CONTRACT NO.  |   |                               | CHECK ONE:<br><input type="checkbox"/> THIS IS A NEW TRANSMITTAL<br><input type="checkbox"/> THIS IS A RESUBMITTAL OF<br>TRANSMITTAL _____ |                          |
| SPECIFICATION SEC. NO. <small>(Cover only one section with<br/>each transmittal)</small>  |   | PROJECT TITLE AND LOCATION   |                     |   |   |                               | CHECK ONE: THIS TRANSMITTAL IS<br>FOR <input type="checkbox"/> FIO <input type="checkbox"/> GOV'T. APPROVAL                                |                          |
| ITEM<br>NO.   | DESCRIPTION OF ITEMS SUBMITTED<br><small>(Type size, model number/etc.)</small> | MFG OR CONTR.<br>CAT., CURVE<br>DRAWING OR<br>BROCHURE NO.<br><small>(See instruction no. 8)</small> | NO.<br>OF<br>COPIES | CONTRACT REFERENCE<br>DOCUMENT  |   | FOR<br>CONTRACTOR<br>USE CODE | VARIATION<br><small>(See<br/>instruction<br/>No. 6)</small>  | FOR<br>CE<br>USE<br>CODE |
|   |   |  |                     | SPEC.<br>PARA. NO.<br><small>e.</small>   | DRAWING<br>SHEET NO.<br><small>f.</small> |                               |  |                          |
| a.  | b.  | c.   | d.                  | e.  | f.  | g.                            | h.   | i.                       |
|   |   |  |                     |   |   |                               |  |                          |
|   |   |  |                     |   |   |                               |  |                          |
|   |   |  |                     |   |   |                               |  |                          |
|   |   |  |                     |   |   |                               |  |                          |
|   |   |  |                     |   |   |                               |  |                          |
|   |   |  |                     |   |   |                               |  |                          |
|   |   |  |                     |   |   |                               |  |                          |
|   |   |  |                     |   |   |                               |  |                          |
|   |   |  |                     |   |   |                               |  |                          |
|   |   |  |                     |   |   |                               |  |                          |
|   |   |  |                     |   |   |                               |  |                          |
| REMARKS   |   |  |                     | I certify that the above submitted items have been reviewed<br>in detail and are correct and in strict conformance with the<br>contract drawings and specifications except as other wise<br>stated. |   |                               |  |                          |
|   |   |  |                     | NAME AND SIGNATURE OF CONTRACTOR  |   |                               |  |                          |
| SECTION II - APPROVAL ACTION  |   |  |                     |   |   |                               |  |                          |
| ENCLOSURES RETURNED <small>(List by Item No.)</small>   |   |  |                     | NAME, TITLE AND SIGNATURE OF APPROVING AUTHORITY  |   |                               |  |                          |
|   |   |  |                     | DATE  |   |                               |  |                          |
| ENG FORM 4025-R, MAR 95   |   |  |                     | EDITION OF SEP 93 IS OBSOLETE.  |   |                               |  | SHEET ____ OF ____       |
|   |   |  |                     |   |   |                               |  | (Proprietor: CEMP-CB)    |

## INSTRUCTIONS

1. Section I will be initiated by the Contractor in the required number of copies.
2. Each transmittal shall be numbered consecutively in the space provided for "Transmittal No.". This number, in addition to the contract number, will form a serial number for identifying each submittal. For new submittals or resubmittals mark the appropriate box; on resubmittals, insert transmittal number of last submission as well as the new submittal number.
3. The "Item No." will be the same "Item No." as indicated on ENG FORM 4288-R for each entry on this form.
4. Submittals requiring expeditious handling will be submitted on a separate form.
5. Separate transmittal form will be used for submittals under separate sections of the specifications.
6. A check shall be placed in the "Variation" column when a submittal is not in accordance with the plans and specifications--also, a written statement to that effect shall be included in the space provided for "Remarks".
7. Form is self-transmittal, letter of transmittal is not required.
8. When a sample of material or Manufacturer's Certificate of Compliance is transmitted, indicate "Sample" or "Certificate" in column c, Section I.
9. U.S. Army Corps of Engineers approving authority will assign action codes as indicated below in space provided in Section I, column i to each item submitted. In addition they will ensure enclosures are indicated and attached to the form prior to return to the contractor. The Contractor will assign action codes as indicated below in Section I, column g, to each item submitted.

### THE FOLLOWING ACTION CODES ARE GIVEN TO ITEMS SUBMITTED

|      |  |       |   |
|------|--|-------|---|
| A -- | Approved as submitted.   | E --  | Disapproved (See attached).   |
| B -- | Approved, except as noted on drawings.   | F --  | Receipt acknowledged.   |
| C -- | Approved, except as noted on drawings.<br>Refer to attached sheet resubmission required. | FX -- | Receipt acknowledged, does not comply<br>as noted with contract requirements. |
| D -- | Will be returned by separate correspondence.   | G --  | Other (Specify)   |

10. Approval of items does not relieve the contractor from complying with all the requirements of the contract plans and specifications.

(Reverse of ENG Form 4025-R)

SECTION 16270  
SUBSTATION TRANSFORMER, DRY-TYPE

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- 2.3 NAMEPLATE
- 2.4 ENCLOSURES

PART 3 EXECUTION

- 3.1 FACTORY TESTING
- 3.2 FIELD TESTING



## SECTION 16270

## SUBSTATION TRANSFORMER, DRY-TYPE

## PART 1 – GENERAL

## 1.1 GENERAL

This section covers the supply of four dry-type substation transformers, rated 13,800V delta – 480V delta and 1000kVA, which are compatible with the existing switchgear bus work, and compatible, if possible, with the existing enclosures and arrestors, such that no modifications shall be necessary to install the supplied transformers in the existing enclosures on the substations at Libby Dam. The Contractor is responsible for the manufacture, factory testing, delivery, and field testing of the transformers.

## 1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

## INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)

- IEEE C57.12.01 (1998) General Requirements for Dry-Type  
Distribution and Power Transformers Including those  
with Solid Cast and/or Resin-Encapsulated Windows
- NEMA C57.12.51 1981(R1998) Requirements for Ventilated Dry-Type Power Transformers, 501 kVA and  
Larger, Three-Phase, with High-Voltage 601 to 34,500 Volts, Low-Voltage 208Y/120 to 4160  
Volts
- IEEE C57.12.55 1987(R1998) Requirements for Transformers-Dry-Type  
Transformers used in Unit Installations, Including  
Unit Substations, Conformance Standard
- IEEE C57.12.91 (2001) Test Code for Dry-Type Distribution and Power  
Transformers

## 1.3 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only

## SD-01 Data

Manufacturer's Catalog; GA

Data composed of catalog cuts, brochures, circulars, specifications, product data, and printed information in sufficient detail and scope to verify compliance with the requirements of the contract documents. Catalog data shall be submitted not later than 45 calendar days after date of receipt of written notice of award.

## SD-04 Drawings

#### Electrical Equipment; GA

Detail drawings shall show physical arrangement, construction details, connections, wiring diagrams, materials used in fabrication, access requirements for installation and maintenance, physical size, electrical characteristics, mounting and support details, and equipment weight. Drawings shall be drawn to scale and/or dimensioned. Optional items shall be clearly identified as included or excluded. Drawings shall be submitted not later than 45 calendar days after date of receipt of written notice of award.

#### SD-06 Instructions

##### Factory Test Procedure; GA

A detailed description of the Contractor's proposed procedures, test equipment, test methods, test values, and pass/fail levels for factory testing. The factory test procedure shall be submitted not later than 30 calendar days prior to the start of factory tests.

##### Field Test Procedure; GA

A detailed description of the Contractor's proposed procedures, test equipment, test methods, test values, and pass/fail levels for field testing. The field test procedure shall be submitted not later than 30 calendar days prior to the start of field tests.

##### O & M Manuals; GA

Complete operating, maintenance, and storage data regarding the transformers and their related equipment shall be submitted as part of the O&M Manual. The manual shall include the manufacturer's name, model number, catalog cuts, parts list, service manual, drawings, and a brief description of all equipment and their basic operating features. The manual shall list routine maintenance procedures, possible breakdowns and repairs, and a trouble-shooting guide including detailed instructions for removal, overhaul, reconditioning and reinstallation of replaceable components. In addition, the manual shall also contain recommended frequency of inspections and cleaning.

#### SD-09 Reports

##### Factory Test Reports; GA

Six copies of the information described below in standard ring binders on 8 1/2 by 11 inch paper from which material may readily be removed and replaced, including a separate section for each test. Rigid plastic dividers with tabs shall separate sections. (See Para. 3.1)

- a. A list of equipment used, with calibration certifications.
- b. A copy of measurements taken.
- c. The dates of testing.
- d. The equipment and values to be verified.
- e. The conditions specified for the test.
- f. The test results, signed and dated.
- g. Final measurements.

This report shall be submitted not later than 30 calendar days after the completion of the tests.

Field Test Reports; GA

Six copies of the same information described above in the same format as the factory test reports. (See Para. 3.2)

This report shall be submitted not later than 30 calendar days after the completion of the tests.

## 1.4 WORKMANSHIP

Perform work in a skillful and craftsman-like manner according to the industry accepted shop practice for the manufacture of this type of transformer.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

Materials, supplies, and parts that make up the transformers specified shall be tested in accordance with the referenced standards specified herein, except as otherwise indicated or where such tests are waived in writing by the Contracting Officer. If the Contractor desires to use an off-the-shelf transformer not manufactured specifically for this application, evidence shall be submitted confirming that the units meet the requirements of these specifications. Any materials required in the work, but not covered by the specifications, shall be approved for the purpose intended prior to their incorporation.

### 2.2 TRANSFORMERS

#### 2.2.1 Type and Rating

The transformers, core and coils only, shall be indoor dry-type, self-cooled (Class AA), and shall be rated 1000kVA, 3-phase, 60Hz, 13800-480 volts, with delta-delta connected windings. The transformers shall conform to the applicable requirements of IEEE C57.12.01, NEMA C57.12.51, and IEEE C57.12.55. Transformer impedance shall be 8 percent subject to ANSI standard tolerances. The transformers' high voltage winding shall have a basic lightning impulse insulation level (BIL) of at least 95kV. The transformers' insulation system shall be Class 220°C. The transformers shall be designed to carry rated load continuously without exceeding 150°C temperature rise above 40°C ambient temperature when installed in the existing ventilated sheet metal enclosures at Libby Dam and cooled by natural air circulation without the use of fans. If this is not possible, the transformers shall be provided with enclosures in which they can achieve this temperature rise without the use of fans. The audible sound level of the enclosed transformers when operating at rated load will not exceed 64dBA.

#### 2.2.2 Core and Coils

a. The core and coils of the transformers shall be rigidly attached to a structural steel base. Removable lifting eyes shall be provided on the core and coil assembly. The core laminations shall be constructed of high quality, non-aging, cold-rolled steel especially suitable for the purpose. The use of paper insulation in the core will not be acceptable. The core laminations shall be free from burrs which may puncture the insulation between laminations and shall be securely fastened to prevent shifting during shipment, excessive vibration in normal service, and displacement under short-circuit conditions. Core joints shall be interleaved.

b. All conductors inside the transformers shall be made of copper including the coils and bus. Four 2-1/2 percent full-capacity taps, 2 above rated voltage and 2 below rated voltage, shall be provided in the high-voltage windings, and suitable means shall be provided for changing the taps while the transformer is de-energized. The terminal boards of the installed enclosed transformers shall be readily accessible. All transformer leads and taps shall be securely braced to prevent displacement or injury during transit or installation and under short-circuit conditions. Two of the transformers shall be configured for installation on the right-hand side of the existing double-ended substations, and the other two transformers shall be configured for installation on the left hand side.

## 2.3 NAMEPLATE

Nameplates shall be provided for the transformers. The nameplates shall be stainless steel, similar in size and thickness to the nameplates on the existing transformer enclosures. The nameplates shall be stamped, or engraved with the information specified in section 5.12 of IEEE C57.12.01.

## 2.4 ENCLOSURES

If the transformers cannot be installed in the existing enclosures at Libby Dam, which are shown in the reference drawings, then new enclosures will be required. These new enclosures will be ventilated sheet metal enclosures for 480-volt Switchgear, except that formed enclosures of not less than No. 13 MSG may be used. The enclosures shall be designed such that no modifications to the existing substations are necessary to install the new enclosed transformers, including the high-voltage cables in their embedded conduits and the low-voltage bus. The new enclosures shall not exceed the long-side dimension of the existing enclosures. The new enclosures may vary in the height and short-side dimensions, but must not extend past the existing center section. Reference drawing C972-1 'Base Detail and Mechanical SQ1 & SQ2' shows the dimensions of the existing equipment. The new enclosures shall have provisions for the reuse of the existing lightning arrestors, which are Cooper Power Systems Varistar Cat# AZES002GO12015. Doors or removable panels shall be provided in the new enclosures to permit access to the transformers, and suitable removable lifting eyes or other approved means shall be provided to permit lifting the enclosure alone and also the complete enclosed transformer by the use of a crane. The enclosures shall be adequately braced and stiffened on the inside, and shall be coated with flame-resistant sound-deadening material, if necessary, so that the audible sound level of the enclosed transformers when operating at rated load will not exceed 64dBA. The enclosures shall also be painted to match the existing substations. A paint sample will be provided upon request.

# PART 3 - EXECUTION

## 3.1 FACTORY TESTING

All of the transformers shall be completely assembled and subjected to the routine tests listed in Table 15 of IEEE C57.12.01. The first transformer manufactured shall also be subjected to the additional tests specified below. The Contracting Officer shall witness all tests required herein, unless waived in writing, and no equipment shall be shipped until the Contracting Officer has approved it for shipment. The Contractor shall notify the Contracting Officer 14 days in advance of the date of the tests, so that arrangements can be made for the Contracting Officer to be present at the tests. The factory tests, including test equipment, test methods, measurements, and computations, shall be in accordance with the applicable requirements of IEEE C57.12.01 and IEEE C57.12.91, and shall be subject to the approval of the Contracting Officer.

a. Temperature rise test. This test shall be made according to IEEE C57.12.91 Section 11. This test is required to demonstrate that the new transformers can meet their rated temperature rise when installed in the existing enclosures at Libby Dam. Therefore, this test shall be made with the transformer inside a replica of the existing enclosures. The replica shall be made of steel, and it shall be grounded and painted in the same manner as the existing enclosures.

b. Audible sound level test. This test will be performed according to IEEE C57.12.91 Section 13. This test is required to demonstrate that the new transformers will not exceed the maximum allowable audible sound level of 64dBA when installed in the existing enclosures at Libby Dam. Therefore, this test shall be made with the transformer inside a replica of the existing enclosure.

c. Impulse test. This test will be performed according to IEEE C57.12.91 Section 10.5. This test is required to demonstrate that the new transformers can meet their rated BIL when installed in the existing enclosures at Libby Dam. Therefore, this test shall be made with the transformer inside a replica of the existing enclosure.

### 3.2 FIELD TESTING

The following tests shall be performed on the transformers after they have been delivered to the site but before they are installed into the existing enclosures.

- a) Winding resistance of both windings on the rated voltage tap
- b) Ratio tests on all tap connections
- c) Applied potential
- d) Core ground

The Contractor shall recommend applicable voltage test levels for the potential tests according to the requirements of IEEE C57.12.91. The Contracting Officer shall witness all tests required herein, unless waived in writing. Each transformer must pass these tests before the Government will accept ownership of the new equipment. The Contractor shall notify the Contracting Officer 14 days in advance of the date of the tests, so that arrangements can be made for the Contracting Officer to be present at the tests. The field tests, including test equipment, test methods, measurements, and computations, shall be in accordance with the applicable requirements of IEEE C57.12.01 and IEEE C57.12.91, and shall be subject to the approval of the Contracting Officer.

List of Drawings (these documents are after the provisions/clauses section)

|                                     |  |  |
|-------------------------------------|--|--|
| Vicinity Map & Project Location Map |  |  |
|                                     |  |  |
| <b>Reference</b> Drawing Number     | Description                                  | Type                                   |
| 218P301H01B & 4420A98               | Substation Transformer Nameplates            | Westinghouse Shop Drawing              |
| 7783D20                             | Sub 2 Outline Drawing                        | Westinghouse Shop Drawing              |
| 7750D33                             | Sub 3 Outline Drawing                        | Westinghouse Shop Drawing              |
| 4330D74                             | Instruction Drawing for Items Shipped Detail | Westinghouse Shop Drawing              |
| C972-1                              | Base Detail and Mechanical SQ1 & SQ2         | Central Electric Mfg. Co. Shop Drawing |

## Section G - Contract Administration Data

## ACCOUNTING AND APPROPRIATION DATA

AA: 96X40450000 082433 32301KH296067352 NA 96453  
COST 000000000000  
CODE:  
AMOUNT: \$32,395.00

AB: 96X40450000 082433 32308525KB067352 NA 96453  
COST 000000000000  
CODE:  
AMOUNT: \$32,395.00

## Section I - Contract Clauses

## CLAUSES INCORPORATED BY FULL TEXT

52.213-4 TERMS AND CONDITIONS--SIMPLIFIED ACQUISITIONS (OTHER THAN COMMERCIAL ITEMS)  
(MAY 2004)

(a) The Contractor shall comply with the following Federal Acquisition Regulation (FAR) clauses that are incorporated by reference:

(1) The clauses listed below implement provisions of law or Executive order:

(i) 52.222-3, Convict Labor (June 2003) (E.O. 11755).

(ii) 52.222-21, Prohibition of Segregated Facilities (Feb 1999) (E.O. 11246).

(iii) 52.222-26, Equal Opportunity (Apr 2002) (E.O. 11246).

(iv) 52.225-13, Restrictions on Certain Foreign Purchases (Dec 2003) (E.o.s, proclamations, and statutes administered by the Office of Foreign Assets Control of the Department of the Treasury).

(v) 52.233-3, Protest After Award (Aug 1996) (31 U.S.C. 3553).

(2) Listed below are additional clauses that apply:

(i) 52.232-1, Payments (Apr 1984).

(ii) 52.232-8, Discounts for Prompt Payment (Feb 2002).

(iii) 52.232-11, Extras (Apr 1984).

(iv) 52.232-25, Prompt Payment (Oct 2003).

(v) 52.233-1, Disputes (Jul 2002).

(vi) 52.244-6, Subcontracts for Commercial Items (May 2004).

(vii) 52.253-1, Computer Generated Forms (Jan 1991).

(b) The Contractor shall comply with the following FAR clauses, incorporated by reference, unless the circumstances do not apply:

(1) The clauses listed below implement provisions of law or Executive order:

(i) 52.222-19, Child Labor--Cooperation with Authorities and Remedies (Jan 2004) (E.O. 13126). (Applies to contracts for supplies exceeding the micro-purchase threshold.)

(ii) 52.222-20, Walsh-Healey Public Contracts Act (DEC 1996) (41 U.S.C. 35-45) (Applies to supply contracts over \$10,000 in the United States, Puerto Rico, or the U.S. Virgin Islands).

(iii) 52.222-35, Equal Opportunity for Special Disabled Veterans, Veterans of the Vietnam Era, and Other Eligible Veterans (DEC 2001) (38 U.S.C. 4212) (Applies to contracts of \$25,000 or more).

(iv) 52.222-36, Affirmative Action for Workers with Disabilities (JUN 1998) (29 U.S.C. 793) (Applies to contracts over \$10,000, unless the work is to be performed outside the United States by employees recruited outside the United States.) (For purposes of this clause, United States includes the 50 States, the District of Columbia, Puerto Rico, the Northern Mariana Islands, American Samoa, Guam, the U.S. Virgin Islands, and Wake Island.).

(v) 52.222-37, Employment Reports on Special Disabled Veterans, Veterans of the Vietnam Era, and Other Eligible Veterans (DEC 2001) (38 U.S.C. 4212) (Applies to contracts over \$25,000).

(vi) 52.222-41, Service Contract Act, As Amended (May 1989) (41 U.S.C. 351, et seq.) (Applies to service contracts over \$2,500 that are subject to the Service Contract Act and will be performed in the United States, District of Columbia, Puerto Rico, the Northern Mariana Islands, American Samoa, Guam, the U.S. Virgin Islands, Johnston Island, Wake Island, or the outer continental shelf lands.).

(vii) 52.223-5, Pollution Prevention and Right-to-Know Information (Aug 2003) (E.O. 13148) (Applies to services performed on Federal facilities).

(viii) 52.225-1, Buy American Act--Supplies (June 2003) (41 U.S.C. 10a-10d) (Applies to contracts for supplies, and to contracts for services involving the furnishing of supplies, for use in the United States or its outlying areas, if the value of the supply contract or supply portion of a service contract exceeds the micro-purchase threshold and the **acquisition--**

(A) Is set aside for small business concerns; or

(B) Cannot be set aside for small business concerns (see 19.502-2), and does not exceed \$25,000.)

(ix) 52.232-33, Payment by Electronic Funds Transfer--Central Contractor Registration (May 1999). (Applies when the payment will be made by electronic funds transfer (EFT) and the payment office uses the Central Contractor Registration (CCR) database as its source of EFT information.)

(x) 52.232-34, Payment by Electronic Funds Transfer--Other than Central Contractor Registration (Oct 2003). (Applies when the payment will be made by EFT and the payment office does not use the CCR database as its source of EFT information.)

(xi) 52.247-64, Preference for Privately Owned U.S.-Flag Commercial Vessels (APR 2003) (46 U.S.C. Appx 1241). (Applies to supplies transported by ocean vessels (except for the types of subcontracts listed at 47.504(d).)

(2) Listed below are additional clauses that may apply:

(i) 52.209-6, Protecting the Government's Interest When Subcontracting with Contractors Debarred, Suspended, or Proposed for Debarment (JULY 1995) (Applies to contracts over \$25,000).

(ii) 52.211-17, Delivery of Excess Quantities (SEPT 1989) (Applies to fixed-price supplies).

(iii) 52.247-29, F.o.b. Origin (JUN 1988) (Applies to supplies if delivery is f.o.b. origin).

(iv) 52.247-34, F.o.b. Destination (NOV 1991) (Applies to supplies if delivery is f.o.b. destination).

(c) FAR 52.252-2, Clauses Incorporated by Reference (FEB 1998). This contract incorporates one or more clauses by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. Also, the full text of a clause may be accessed electronically at this/these address(es):

<http://www.arnet.gov/far>



<http://www.farsite.hill.af.mil>  
<http://www.dtic.mil/dfars>

(d) Inspection/Acceptance. The Contractor shall tender for acceptance only those items that conform to the requirements of this contract. The Government reserves the right to inspect or test any supplies or services that have been tendered for acceptance. The Government may require repair or replacement of nonconforming supplies or reperformance of nonconforming services at no increase in contract price. The Government must exercise its postacceptance rights--

(1) Within a reasonable period of time after the defect was discovered or should have been discovered; and

(2) Before any substantial change occurs in the condition of the item, unless the change is due to the defect in the item.

(e) Excusable delays. The Contractor shall be liable for default unless nonperformance is caused by an occurrence beyond the reasonable control of the Contractor and without its fault or negligence, such as acts of God or the public enemy, acts of the Government in either its sovereign or contractual capacity, fires, floods, epidemics, quarantine restrictions, strikes, unusually severe weather, and delays of common carriers. The Contractor shall notify the Contracting Officer in writing as soon as it is reasonably possible after the commencement of any excusable delay, setting forth the full particulars in connection therewith, shall remedy such occurrence with all reasonable dispatch, and shall promptly give written notice to the Contracting Officer of the cessation of such occurrence.

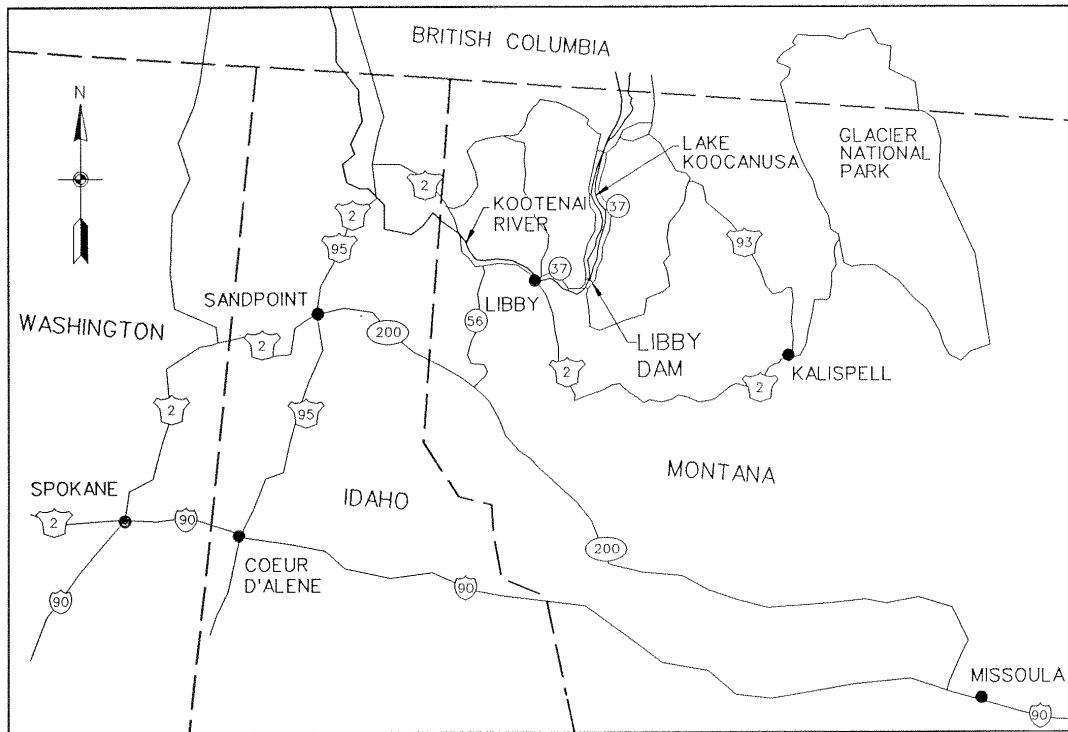
(f) Termination for the Government's convenience. The Government reserves the right to terminate this contract, or any part hereof, for its sole convenience. In the event of such termination, the Contractor shall immediately stop all work hereunder and shall immediately cause any and all of its suppliers and subcontractors to cease work. Subject to the terms of this contract, the Contractor shall be paid a percentage of the contract price reflecting the percentage of the work performed prior to the notice of termination, plus reasonable charges that the Contractor can demonstrate to the satisfaction of the Government, using its standard record keeping system, have resulted from the termination. The Contractor shall not be required to comply with the cost accounting standards or contract cost principles for this purpose. This paragraph does not give the Government any right to audit the Contractor's records. The Contractor shall not be paid for any work performed or costs incurred that reasonably could have been avoided.

(g) Termination for cause. The Government may terminate this contract, or any part hereof, for cause in the event of any default by the Contractor, or if the Contractor fails to comply with any contract terms and conditions, or fails to provide the Government, upon request, with adequate assurances of future performance. In the event of termination for cause, the Government shall not be liable to the Contractor for any amount for supplies or services not accepted, and the Contractor shall be liable to the Government for any and all rights and remedies provided by law. If it is determined that the Government improperly terminated this contract for default, such termination shall be deemed a termination for convenience.

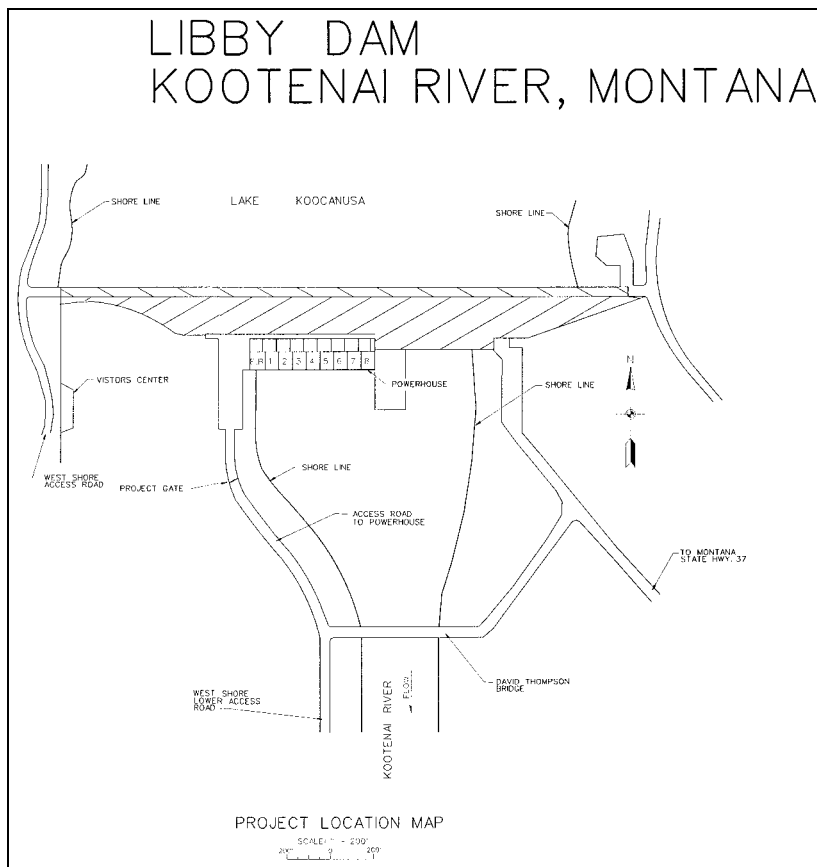
(h) Warranty. The Contractor warrants and implies that the items delivered hereunder are merchantable and fit for use for the particular purpose described in this contract.

(End of clause)

#### CLAUSES INCORPORATED BY REFERENCE



VICINITY MAP



Westinghouse



1000KVA  
13800-480 VOLTS  
60 HERTZ  
IMPEDANCE  %  
AT AA RATING  
L. SPEC. 934943

THREE PHASE  
TYPE ASL  
POWER CENTER  
TRANSFORMER  
CLASS AA

FULL LOAD  
CONTINUOUSLY  
150 °C. RISE  
SERIAL

INSTRUCTION BOOK

FULL WAVE IMPULSE TEST LEVEL: HIGH VOLTAGE 50 KV., LOW VOLTAGE 10 KV.

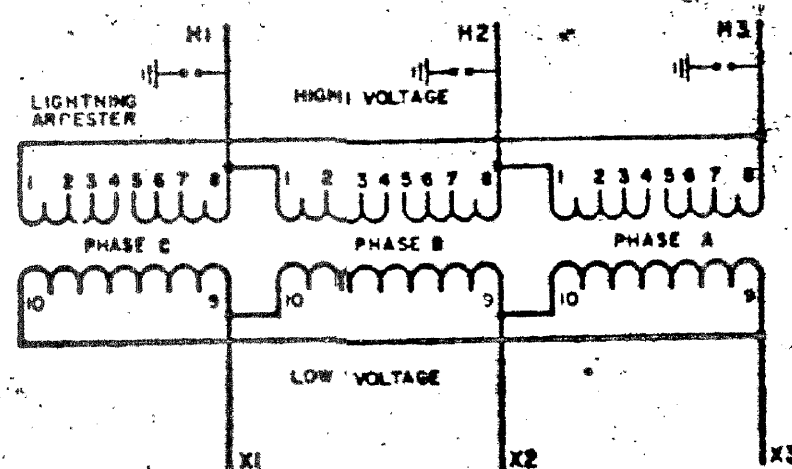
APPROX. WEIGHT IN LBS.  
CORE & COILS

TOTAL

MADE IN U.S.A.

WESTINGHOUSE ELECTRIC CORPORATION

218 P.301H01B



| CONNECTIONS              |       |                     |                       |
|--------------------------|-------|---------------------|-----------------------|
| WINDING                  | VOLTS | 1000 KVA<br>AMPERES | CONNECT IN EACH PHASE |
| HIGH<br>VOLTAGE<br>DELTA | 14490 | 39.8                | 4 TO 5                |
|                          | 14145 | 40.8                | 3 TO 5                |
|                          | 13800 | 41.8                | 3 TO 6                |
|                          | 13455 | 42.9                | 2 TO 6                |
| LOW<br>VOLTAGE<br>DELTA  | 13110 | 44.0                | 2 TO 7                |
|                          | 480   | 1202.8              |                       |

THIS TRANSFORMER WILL CARRY 1333 KVA WITHOUT EXCEEDING 150 °C. AVERAGE TEMPERATURE RISE WHEN ADEQUATE COOLING EQUIPMENT IS ADDED.



0.18 STAINLESS STEEL #6248—SATIN FINISH—ETCHED—FILLED WITH BAKED BLACK ENAMEL  
REDUCE TO 5/8" X 1/8" PROPORTION 25:1 AREA 48 SQ. IN.  
S. B. WAP 2412 ASSEMBLY SEC. SHARON

1/4" HOLES FOR 1/4" X 2" SCREW  
1/2" (1/4") 7/16" BETWEEN CENTERS OF HOLES ON LONG EDGE OF PLATE  
1/2" (1/4") 1/2" BETWEEN CENTERS OF HOLES ON SHORT EDGE OF PLATE  
RETURN TO WESTINGHOUSE ELECTRIC CORPORATION, SHARON WORKS, SHARON, PA., U. S. A.

Dwg No 218P301H01B

REMOVED NO LEAD  
MRISTVEY 3/8/74  
R. S. WALSH 2/1/74  
REPRODUCE ON GRAF-P-115 PAPER  
SHEET NO 2700 SHARON WORKS 1-19-61

APPROVED  
CORPS OF ENGINEERS, U. S. ARMY  
NORTH PACIFIC DIVISION  
DATE 1975 AUG 22  
BY *E. M. Shurdeahl*  
HYDRO-ELECTRIC DESIGN BRANCH

Westinghouse



1000 KVA  
13800-480 VOLTS  
60 HERTZ  
IMPEDANCE  %  
AT AA RATING

THREE PHASE  
TYPE ASL  
POWER CENTER  
TRANSFORMER  
CLASS AA

FULL LOAD  
CONTINUOUSLY  
150 °C. RISE  
SERIAL   
L. SPEC. 934943

INSTRUCTION BOOK IB WAP 2527

FULL WAVE IMPULSE TEST LEVEL: H.V. 50 KV., L.V. 10 KV.

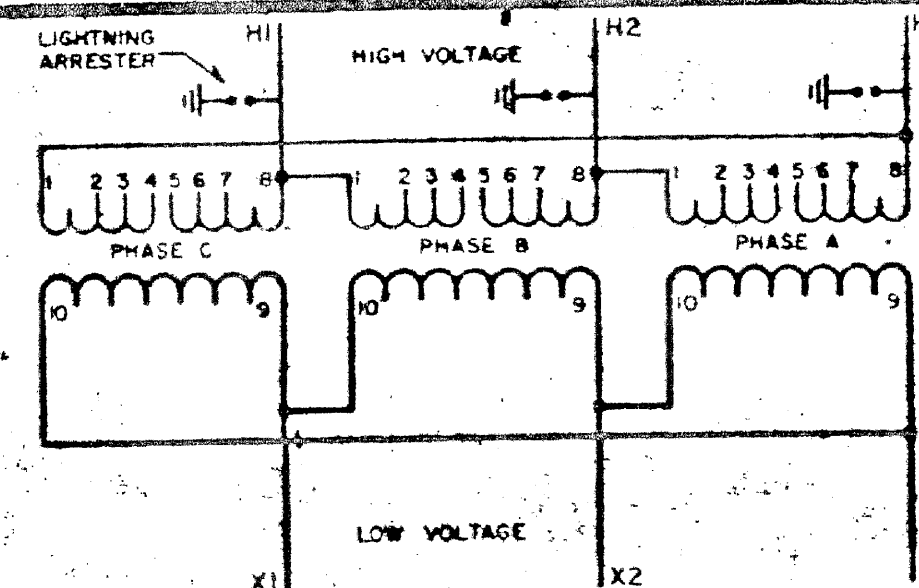
APPROX. WEIGHT IN LBS.  
CORE AND COILS

5140 TOTAL 6210

MADE IN U.S.A.

WESTINGHOUSE ELECTRIC CORPORATION

4420A98



| CONNECTIONS              |       |                       |                       |
|--------------------------|-------|-----------------------|-----------------------|
| WINDING                  | VOLTS | AMPERES<br>AT 1000KVA | CONNECT IN EACH PHASE |
| HIGH<br>VOLTAGE<br>DELTA | 14490 | 39.8                  | 4 TO 5                |
|                          | 14145 | 40.8                  | 3 TO 5                |
|                          | 13800 | 41.8                  | 3 TO 6                |
|                          | 13455 | 42.9                  | 2 TO 6                |
| LOW<br>VOLTAGE<br>DELTA  | 13110 | 44.0                  | 2 TO 7                |
|                          | 480   | 1202.8                |                       |

THIS TRANSFORMER WILL CARRY 1333 KVA WITHOUT EXCEEDING 150 °C. AVERAGE TEMPERATURE RISE WHEN ADEQUATE COOLING EQUIPMENT IS USED.



0.18 STAINLESS STEEL #6248—SATIN FINISH—ETCHED—FILLED WITH BAKED BLACK ENAMEL  
REDUCE TO 5/8" X 1/8" PROPORTION 25:1 AREA 48 SQ. IN.  
S. B. WAP 2527 NO UNITE ENGINEER MODERELL DATE 6-5-74 DWG NO 4420A98  
RETURN TO WESTINGHOUSE ELECTRIC CORPORATION, SHARON WORKS, SHARON, PA., U. S. A.

GOVT CONTRACT NO. DACW67-73C0115

APPROVED  
CORPS OF ENGINEERS, U. S. ARMY  
NORTH PACIFIC DIVISION  
DATE 1975 AUG 22  
BY *E. M. Shurdeahl*  
HYDRO-ELECTRIC DESIGN BRANCH

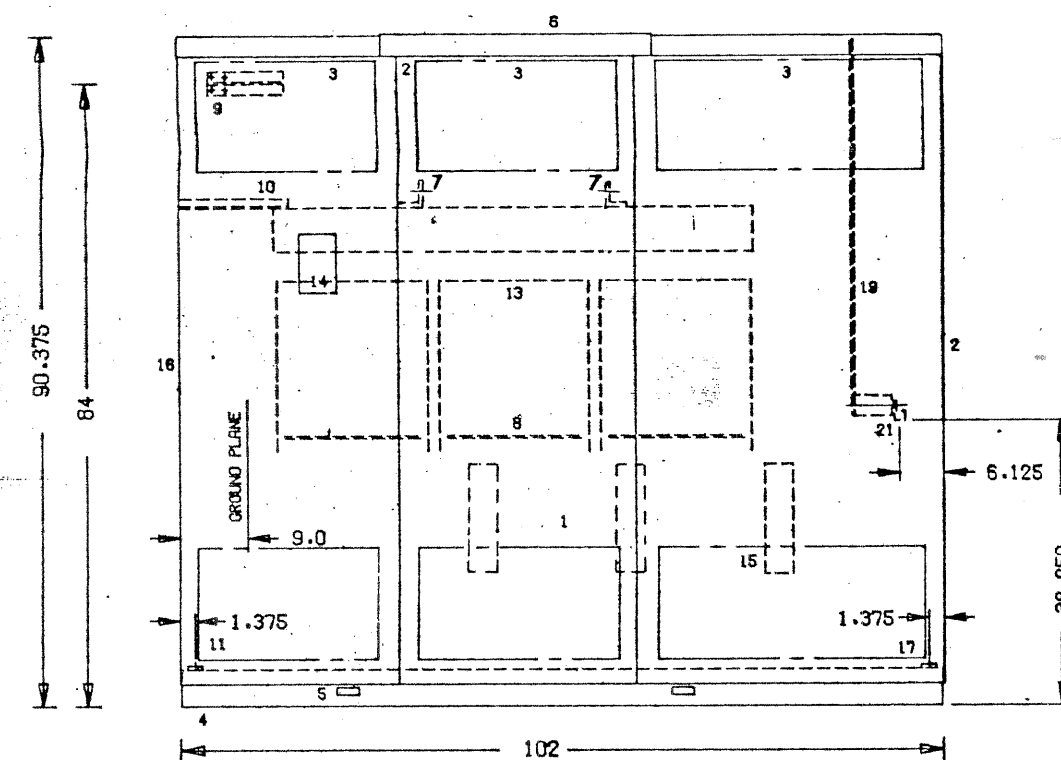
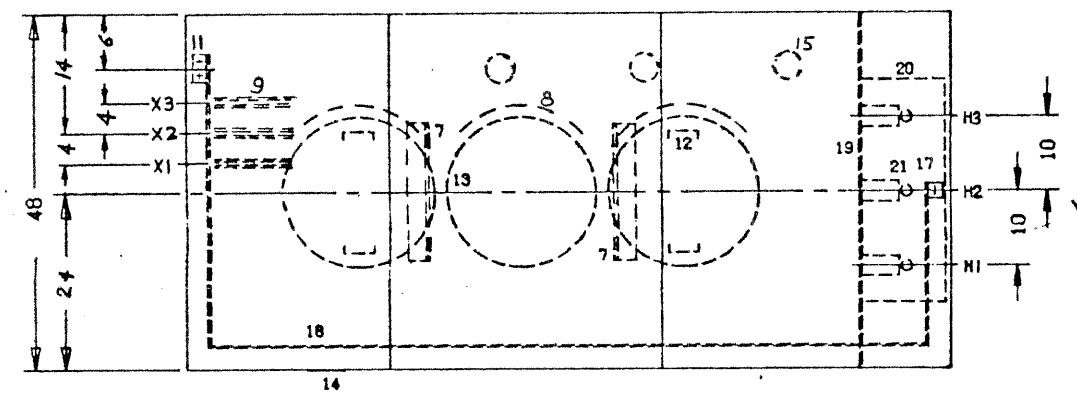
Libby 480 V substations  
DACW67-73-C-0115  
TO NPS 22 Aug 75

■ DETAIL FIGURES ARE SHOWN ON DRAWING 4330-D-74

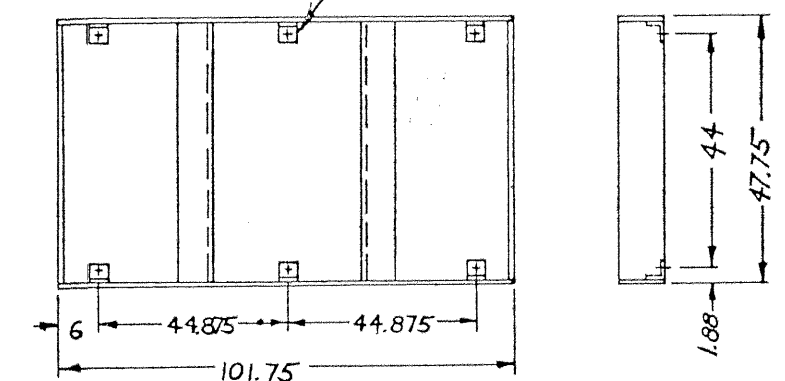
| APPROXIMATE NET WEIGHTS |           |
|-------------------------|-----------|
| CORE AND COILS -----    | 5140 LBS. |
| CASE AND FITTINGS ----- | 1070 LBS. |
| TOTAL -----             | 6210 LBS. |

ITEM FITTINGS AND DESCRIPTIONS

- 1 CASE
- 2 REMOVABLE PANELS
- 3 VENTILATION GRILLE
- ▲ 4 5 INCH BAR BASE - SEE FIGURE 21 AND DETAIL
- 5 1 X 3 INCH CUTOUT IN BASE FOR JACKING TRANSFORMER - WITH COVER PLATES
- 6 REMOVABLE COVER FOR ACCESS TO LIFTING LUGS
- 7 LIFTING LUGS - 2 TOTAL
- 8 H.V. TAPS AND CONNECTORS
- ▲ 9 L.V. FLEXIBLE CONNECTORS - 3 PER PHASE - 9 TOTAL - SEE FIGURE 3
- 10 TIE PLATE - 1 TOTAL - REMOVE AFTER INSTALLATION
- ▲ 11 GROUND PAD - SEE FIGURE 7
- ▲ 12 VIBRATION DAMPENERS - REMOVE SHIPPING SHIMS AND BOLTS AFTER INSTALLATION - SEE FIGURE 8
- 13 CORE AND COILS - MOUNTED ON ITEM 12
- 14 DIAGRAM INSTRUCTION PLATE
- 15 LIGHTNING ARRESTERS - LOW RATIO- S-349B594H07 - 15 KV
- ▲ 16 L.V. END DRILLING - SEE FIGURE 9
- ▲ 17 GROUND PAD - SEE FIGURE 26
- 18 CONTINUOUS GROUND BUS
- 19 H.V. TERMINAL COMPARTMENT BARRIER
- 20 12 X 30 INCH OPEN AREA IN BASE FOR H.V. ENTRANCE
- 21 H.V. TERMINALS - 3 TOTAL- CABLE RANGE - #6-350 MCM



TIE DOWN LUGS FOR  
.50; DIA. BOLTS.-6 TOTAL



BASE DETAIL FOR BOLTING DOWN UNIT

APPROVED  
CORPS OF ENGINEERS, U. S. ARMY  
NORTH PACIFIC DIVISION  
DATE: 20 FEB 1978  
BY: M. Shurlahl  
HYDRO-ELECTRIC DESIGN BRANCH

GOVT CONTRACT NO. DACW 67-73-C-0115

▲ SEE DRAWING 4330-D-74 FOR FIGURE NUMBER DETAIL  
\* SEND PRINTS TO CUSTOMER

150 DEG. C. RISE

WESTINGHOUSE ELECTRIC CORPORATION

APPARATUS ASL POWER CENTER TRANSF. - CLASS AA/FUT FA 1000/1333 KVA  
INDOOR - 3 PHASE 60 HERTZ - H.V. 13800 DELTA - L.V. 480 DELTA

INDOOR - 3 PHASE 60 HERTZ - H.V. 13800 DELTA - L.V. 480 DELTA  
DIMENSIONS IN INCHES-SCALE NTS SUB #2 OUTLINE

|            |          |  |      |     |    |         |
|------------|----------|--|------|-----|----|---------|
| PROGRAMMER | STAFFORD |  | DFTM | 1-1 | 10 | 7702000 |
|------------|----------|--|------|-----|----|---------|

|         |       |      |         |
|---------|-------|------|---------|
| 6/06/74 | 08:27 | APPO | 7783020 |
|---------|-------|------|---------|

|                                     |   |     |                     |  |
|-------------------------------------|---|-----|---------------------|--|
| ENGR. MODERELLI                     | K | HPD |                     |  |
| TRANSFORMER DIVISION - SHARON PLANT |   |     | SHARON, PA., U.S.A. |  |

7783020

## - NOTES -

SEE INSTRUCTION BOOK FOR INSTALLATION AND MAINTENANCE.  
THIS OUTLINE MAY BE USED FOR ERECTION PURPOSES. IT IS NOT TO BE REGARDED AS INDICATING THE EXACT DETAILS OF CONSTRUCTION.  
TRANSFORMER VIBRATION DAMPENER SHIMS, TEMPORARY LEAD BRACES, TIE PLATES AND OTHER SHIPPING SUPPORTS WHICH ARE TO BE REMOVED BEFORE OPERATING THE TRANSFORMER ARE PRINTED YELLOW AND TAGGED FOR REMOVAL.

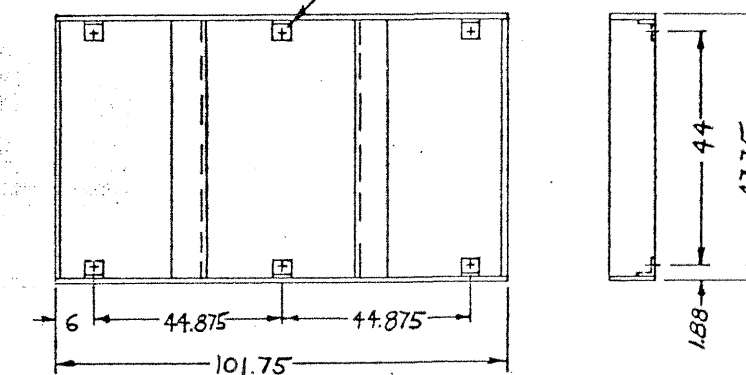
■ DETAIL FIGURES ARE SHOWN ON DRAWING 4330-D-74

| APPROXIMATE NET WEIGHTS |           |
|-------------------------|-----------|
| CORE AND COILS          | 5770 LBS. |
| CASE AND FITTINGS       | 1070 LBS. |
| TOTAL                   | 6840 LBS. |

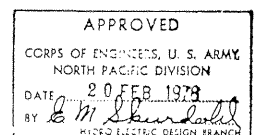
| ITEM | FITTINGS AND DESCRIPTIONS   |
|------|---|
| 1    | CASE  |
| 2    | REMOVABLE PANELS  |
| 3    | VENTILATION GRILLE  |
| 4    | 5 INCH BAR BASE - SEE FIGURE 21 AND DETAIL  |
| 5    | 1 X 3 INCH CUTOUT IN BASE FOR JACKING TRANSFORMER - WITH COVER PLATES                   |
| 6    | REMOVABLE COVER FOR ACCESS TO LIFTING LUGS  |
| 7    | LIFTING LUGS - 2 TOTAL  |
| 8    | H.V. TAPS AND CONNECTORS  |
| 9    | L.V. FLEXIBLE CONNECTORS - 3 PER PHASE - 9 TOTAL - SEE FIGURE 3                         |
| 10   | TIE PLATE - 1 TOTAL - REMOVE AFTER INSTALLATION   |
| 11   | GROUND PAD - SEE FIGURE 7   |
| 12   | VIBRATION DAMPENERS - REMOVE SHIPPING SHIMS AND BOLTS AFTER INSTALLATION - SEE FIGURE 9 |
| 13   | CORE AND COILS - MOUNTED ON ITEM 12   |
| 14   | DIAGRAM INSTRUCTION PLATE   |
| 15   | LIGHTNING ARRESTERS - LOW RATIO - S-3498594H07 - 15 KV                                  |
| 16   | L.V. END DRILLING - SEE FIGURE 9  |
| 17   | GROUND PAD - SEE FIGURE 26  |
| 18   | CONTINUOUS GROUND BUS   |
| 19   | H.V. TERMINAL COMPARTMENT BARRIER   |
| 20   | 16 X 30 INCH OPEN AREA IN BASE FOR H.V. ENTRANCE  |
| 21   | H.V. TERMINALS - 3 TOTAL - CABLE RANGE - #6-350 MCM                                     |

REQ'D TO MEET BIL

TIE DOWN LUGS FOR  
.50 DIA. BOLTS - 6 TOTAL



BASE DETAIL FOR BOLTING DOWN UNIT



GOVT CONTRACT No DACW67-73-C-0115

▲ SEE DRAWING 4330-D-74 FOR FIGURE NUMBER DETAIL  
★ SEND PRINTS TO CUSTOMER

150 DEG. C. RISE

WESTINGHOUSE ELECTRIC CORPORATION

APPARATUS: ASL POWER CENTER TRANS. - CLASS RA/FUT FA 1000/1333 KVA  
INDOOR - 3 PHASE 60 HERTZ - H.V. 13800 DELTA - L.V. 480 DELTA  
DIMENSIONS IN INCHES-SCALE NTS

|                                     |           |      |         |                     |          |       |         |
|-------------------------------------|-----------|------|---------|---------------------|----------|-------|---------|
| PROGRAMMER                          | STAFFORD  | DATE | 2/21/74 | 17:22               | APPROVED | WALSH | 7750033 |
| ENGR.                               | MODERELLI | DATE | 2/21/74 | 17:22               | APPROVED | WALSH | 7750033 |
| TRANSFORMER DIVISION - SHARON PLANT |           |      |         | SHARON, PA., U.S.A. |          |       |         |

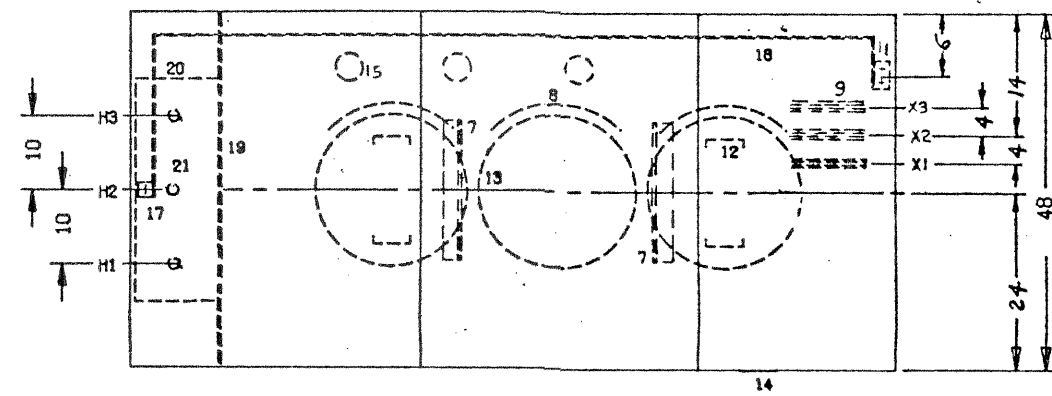


FIG. 1

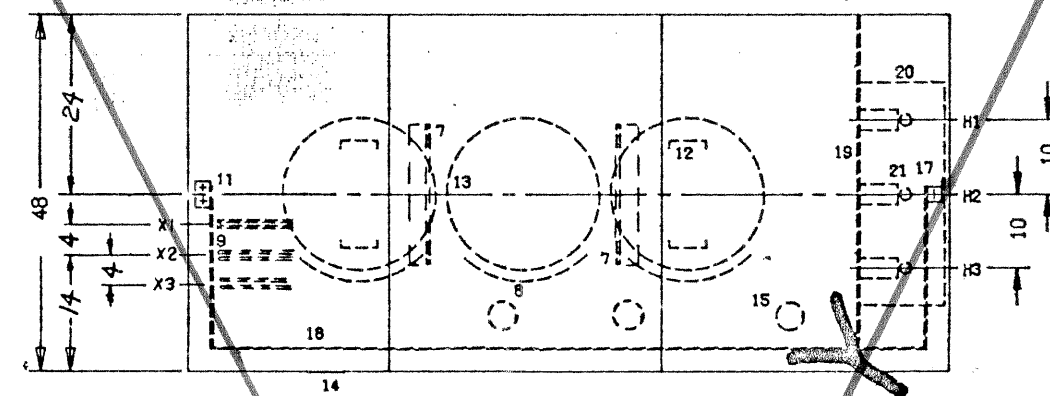


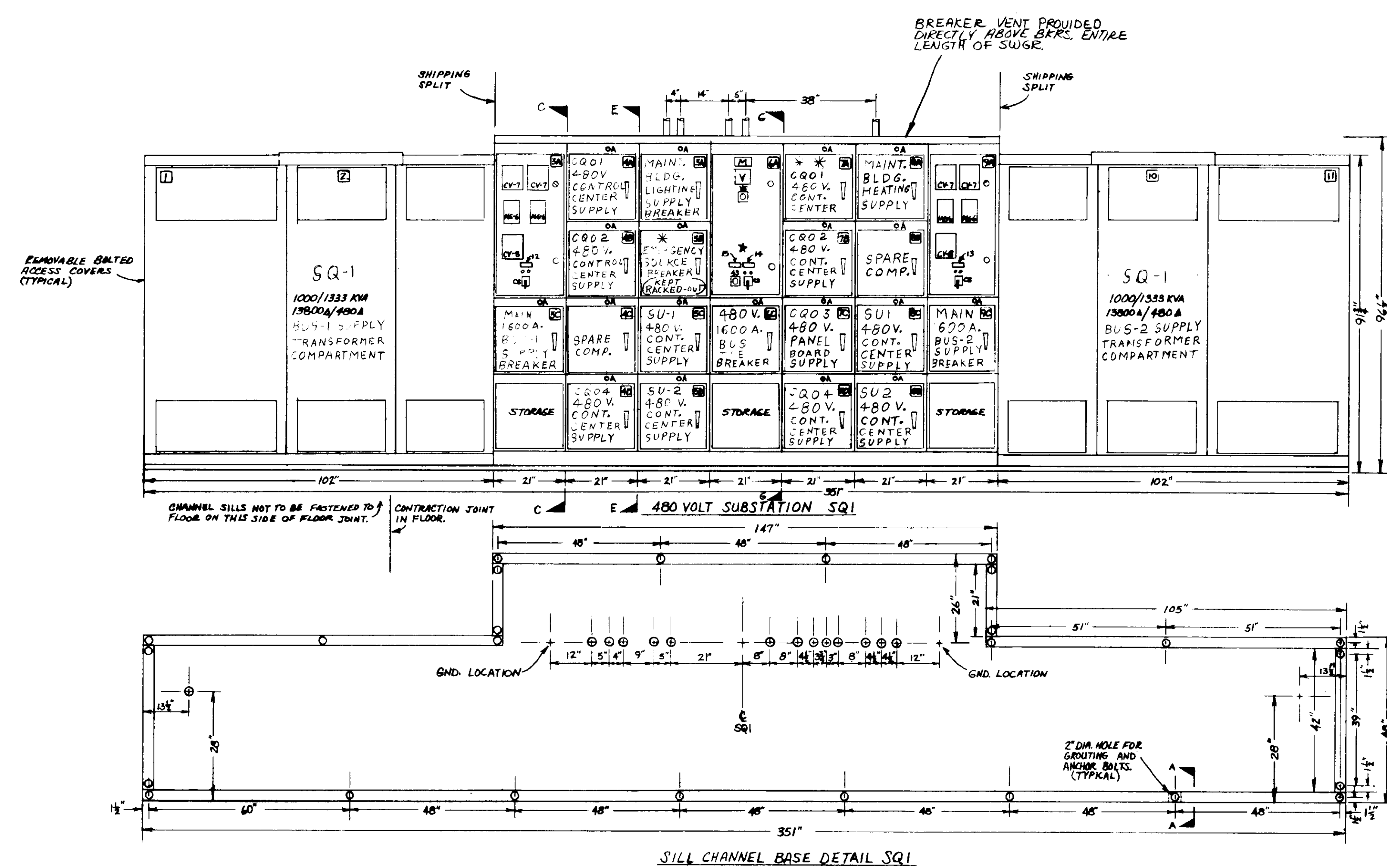
FIG. 2

DOES NOT APPLY

|    |         |   |
|----|---------|---|
| SO | MRP2412 | 1 |
| D  | 887897  |   |
| IT | DATE    |   |
| 1  | WA 24.2 | 2 |
| 2  | WA 24.2 | 2 |
| 3  | WA 24.2 | 2 |
| 4  | WA 24.2 | 2 |
| 5  | WA 24.2 | 2 |
| 6  | WA 24.2 | 2 |
| 7  | WA 24.2 | 2 |
| 8  | WA 24.2 | 2 |
| 9  | WA 24.2 | 2 |
| 10 | WA 24.2 | 2 |
| 11 | WA 24.2 | 2 |
| 12 | WA 24.2 | 2 |
| 13 | WA 24.2 | 2 |
| 14 | WA 24.2 | 2 |
| 15 | WA 24.2 | 2 |
| 16 | WA 24.2 | 2 |
| 17 | WA 24.2 | 2 |
| 18 | WA 24.2 | 2 |
| 19 | WA 24.2 | 2 |
| 20 | WA 24.2 | 2 |
| 21 | WA 24.2 | 2 |







APPROXIMATE WEIGHTS.

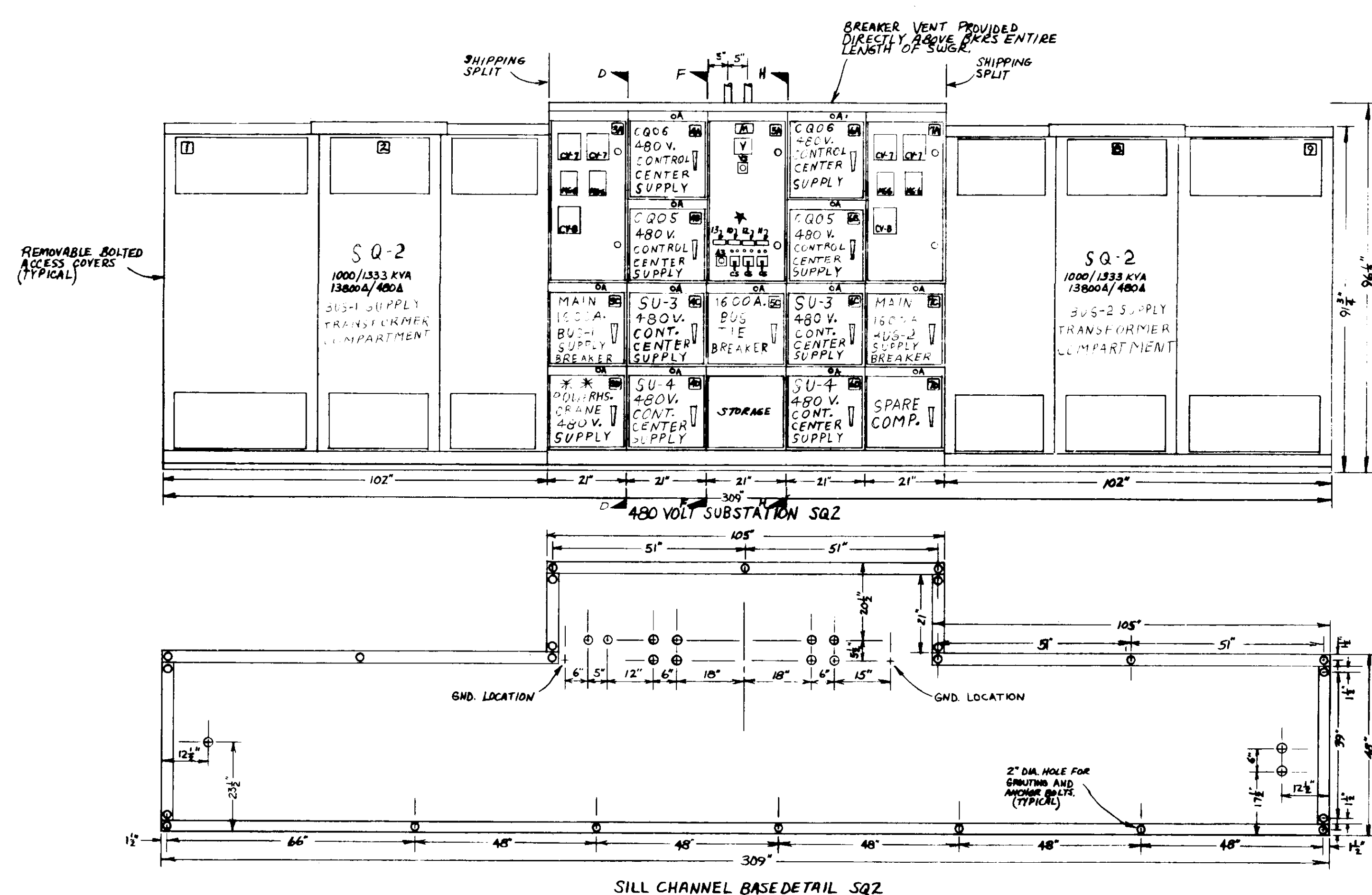
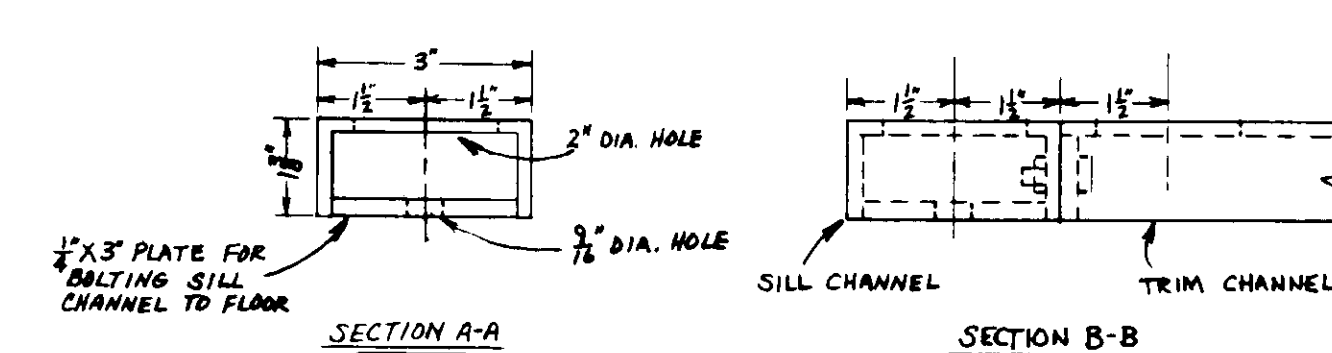
|              |             |
|--------------|-------------|
| TRANS. BUS 1 | 6840 lbs.   |
| TRANS. BUS 2 | 6210 lbs.   |
| SWGR.        | 12,100 lbs. |
| TOTAL        | 25,150 lbs. |

\* EMERGENCY SOURCE BREAKER IN COMPARTMENT (58) SHALL BE KEY INTERLOCKED SO THAT IT MAY BE CLOSED ONLY WHEN THE BUS NO.1 SUPPLY BREAKER (3C) AND THE BUS TIE BREAKER (6C) ARE OPEN. COMPARTMENT (58) HAS BEEN EXTENDED SO BREAKER CAN BE LEFT IN A RACKED OUT POSITION.

\*\* THIS BREAKER EQUIPPED WITH SHUNT TRIP.

\* CONTROL SOURCE DISCONNECTS  
MOUNTED INSIDE COMPARTMENT

NOTE: ACCESS THROUGH CUBICLE DOORS  
FOR FASTENING SWITCHGEAR TO  
GROUTED-IN FLOOR CHANNELS.

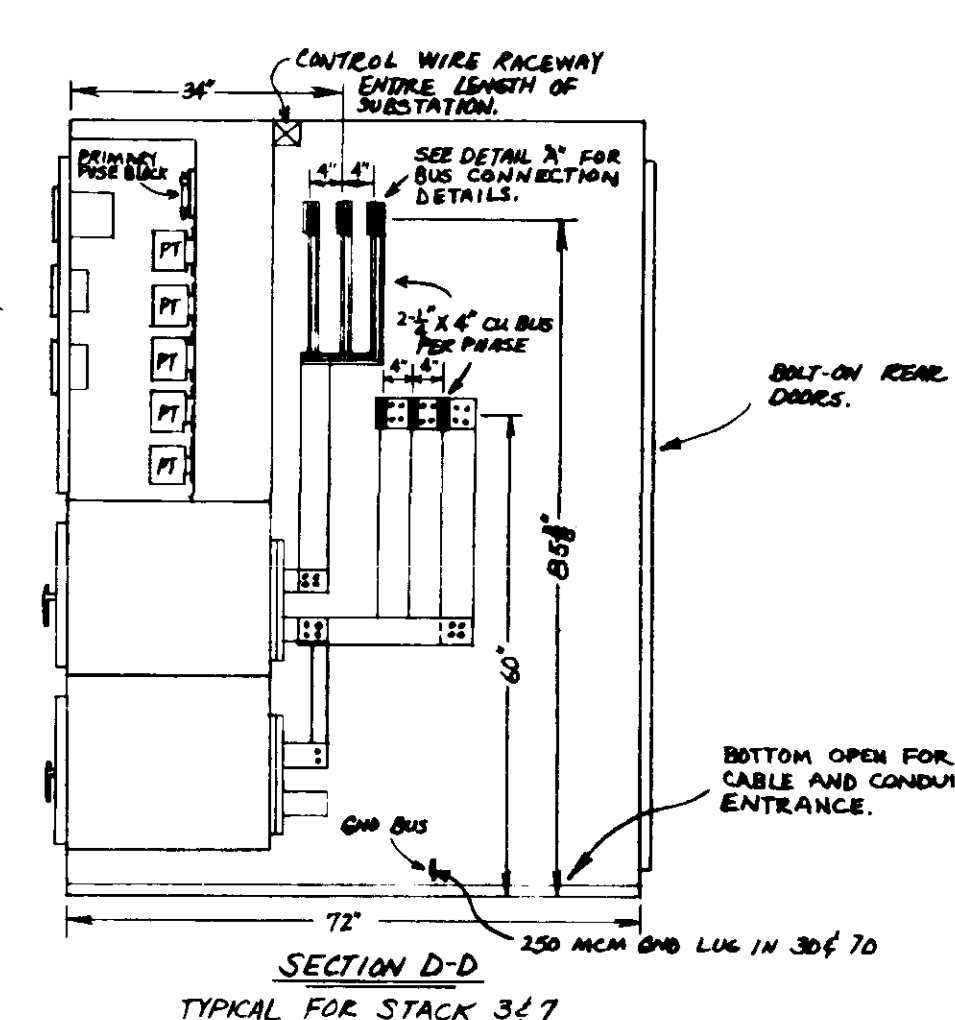


| APPROXIMATE WEIGHTS |             |
|---------------------|-------------|
| TRANS. BUS 1        | 6840 lbs.   |
| TRANS. BUS 2        | 6210 lbs.   |
| SWGR.               | 8600 lbs.   |
| TOTAL               | 21,650 lbs. |

## THIS BREAKER EQUIPPED  
WITH SHUNT TRIP.

★ CONTROL SOURCE DISCONNECTS  
MOUNTED INSIDE COMPARTMENT

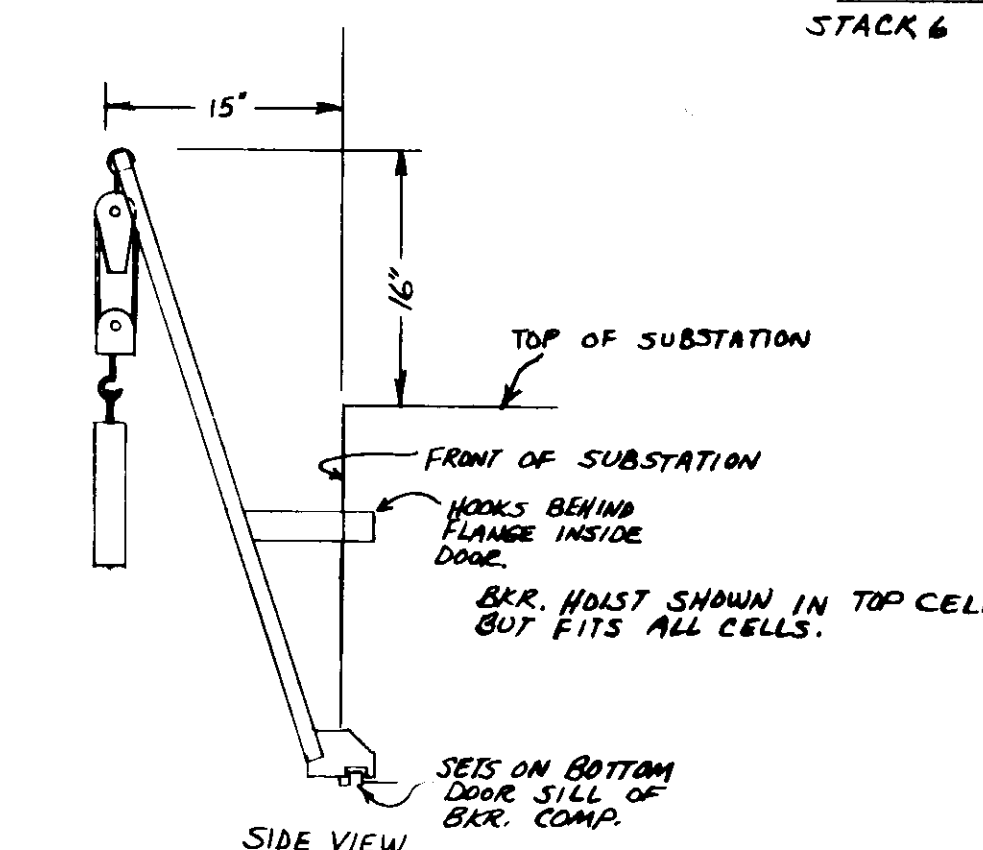
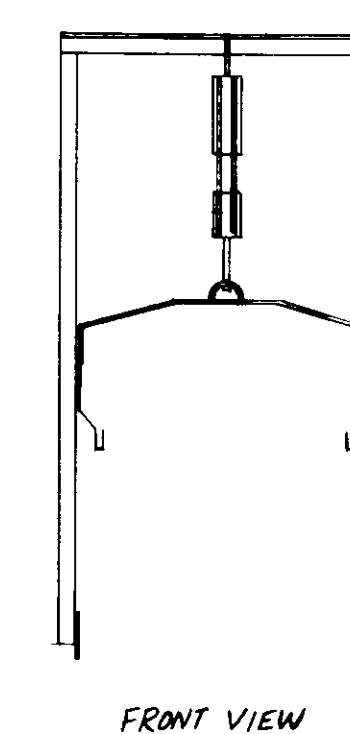
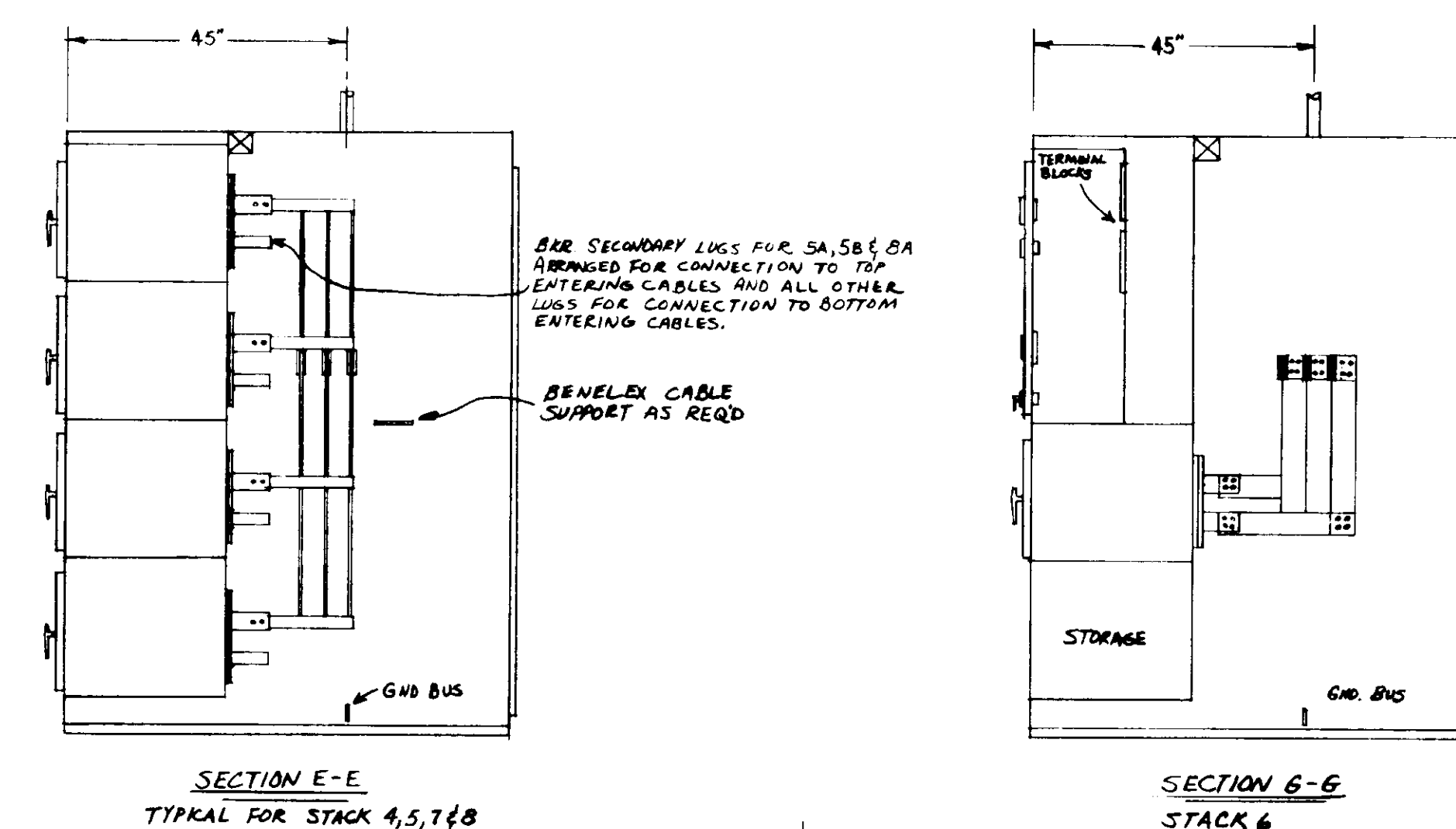
NOTE: ACCESS THROUGH CUBICLE DOOR.  
FOR FASTENING SWITCHGEAR TO  
GROUTED-IN FLOOR CHANNELS.



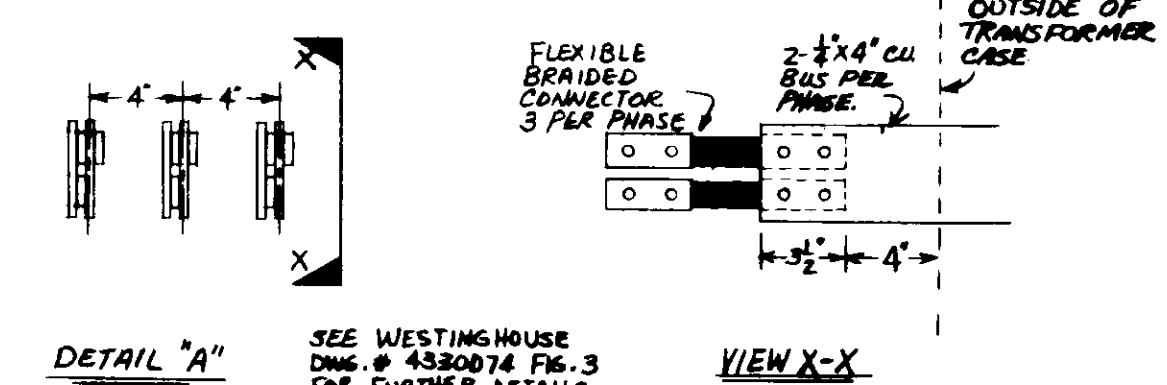
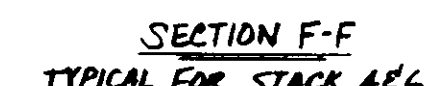
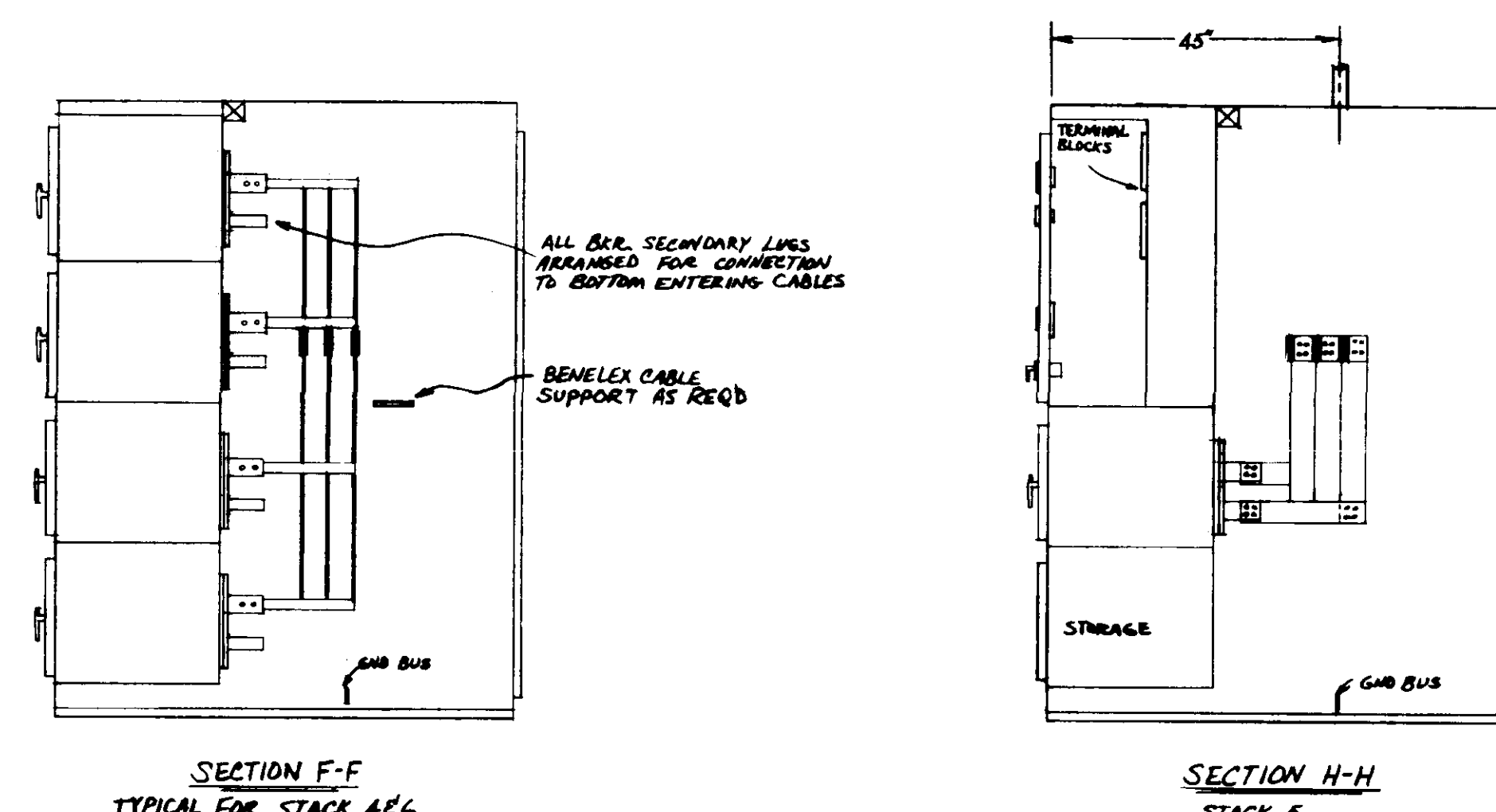
STEEL - SWGR. 11 GAUGE  
TRANSF. 13 GAUGE  
PAINT - INDOOR LIGHT GRAY ANSI NO. 6 (TWO EXTERIOR COATS)

CHANNEL - 3" CHANNEL, SHIPPED SEPARATE  
WITH PROVISIONS FOR BOLTING  
TOGETHER AT EACH CORNER

BUS - MAIN BUS - 2-1" X 4" COPPER PER PHASE  
FEEDER BUS - 1/2" X 2" COPPER.  
FLEX CONNECTORS PROVIDED FOR  
CONNECTION TO TRANSFORMER. 3-PER PHASE  
GND BUS - 1/2" COPPER FULL LENGTH



BREAKER HOIST



| NO. | DATE | ISSUED | NO. | DATE     | REVISION                                |
|-----|------|--------|-----|----------|---|
|     |      |        | 1   | 4-15-74  |   |
|     |      |        | 2   | 8-11-74  | REPL. 2-10-74, RELOCATED 2-10-74, ADDED |
|     |      |        | 3   | 11-26-74 | ADDED 2ND MOST DETAIL.                  |
|     |      |        | 4   | 4-16-75  | CHANGED TRANS. WEIGHTS.                 |
|     |      |        | 4A  | 7-1-80   | UPGRADED TO AS BUILT                    |

SEATTLE DISTRICT, CORPS OF ENGINEERS  
ALASKAN WAY SOUTH  
SEATTLE, WASHINGTON 98134

CENTRAL ELECTRIC MFG. CO.  
FULTON MISSOURI 65251

|                       |   |                              |
|-----------------------|---|------------------------------|
| DATE<br>12-6-73       | DRAWING TITLE<br>BASE DETAIL AND MECHANICAL SQ1 & SQ2 | JOB NO.<br>DACW 67-73-C-0115 |
| SCALE<br>1/2" = 1'-0" | JOB TITLE<br>LIBBY DAM UNIT SUBSTATIONS               | DRAWING NO.<br>C972-1        |
| DRAWN BY<br>DH        | JOB ADDRESS<br>LIBBY DAM PROJECT<br>LIBBY, MONTANA    | REVISION NO.<br>4A           |

APPROVED  
CORPS OF ENGINEERS U.S. ARMY  
NORTH BRIDGE DIVISION  
DATE 20 FEB 1979  
BY E. M. Shurdall